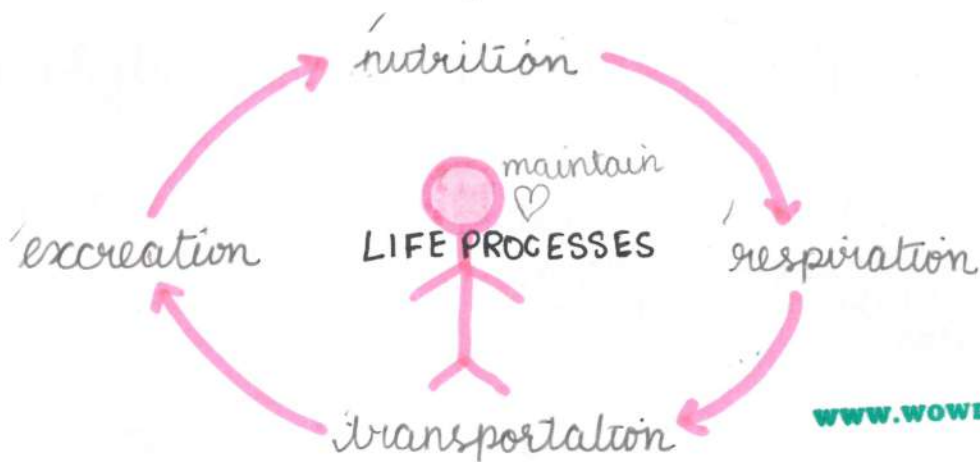


Nutrition

LIFE PROCESSES:

Process that ^{are needed by} all living beings to maintain their life. ♡



NUTRITION

▷ Process by which an organism obtains nutrients from food and utilises them to obtain energy and for building, repairing their tissues.



▷ Nutrients

- * substances required for proper growth and maintenance of a living body.
- * materials that provide energy to an organism.

▷ TYPES

- * autotrophs
- * heterotrophs

Autotrophs

Heterotrophs

Define

organisms synthesise their own food from simple inorganic subs. like CO_2 & H_2O in presence of sunlight.

organisms that are dependent on other organisms and obtain energy from organic molecules already produced by autotrophs.

Food Chain

bottom-producers FOOD CHAIN consumers - middle above producers

Chlorophyll

Chlorophyll ✓ present

absent - chlorophyll ✗

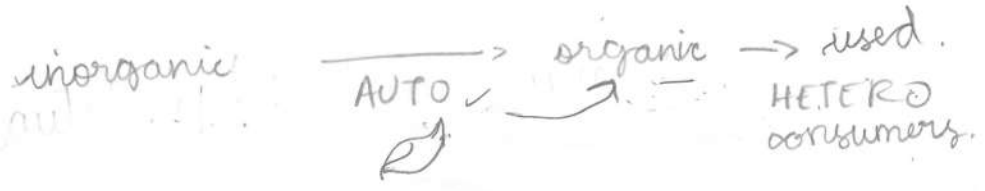
digest

no digestion

digestion occurs
complex organic → simpler / soluble forms

green plants
bacteria

animals



Leaf-adapt

SURFACE AREA

- flat, thin [↑ gas]

POSITION

- outwardly - pure AIR,

VEINS, VEINLETS, MIDRIB

- wide network - quick-circulate

CHLOROPHYLL

STOMATA ↑

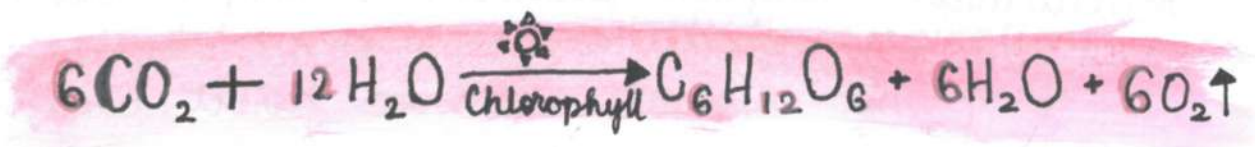
ENZYMES

FOOD STORAGE ↑

www.wowmyspace.com

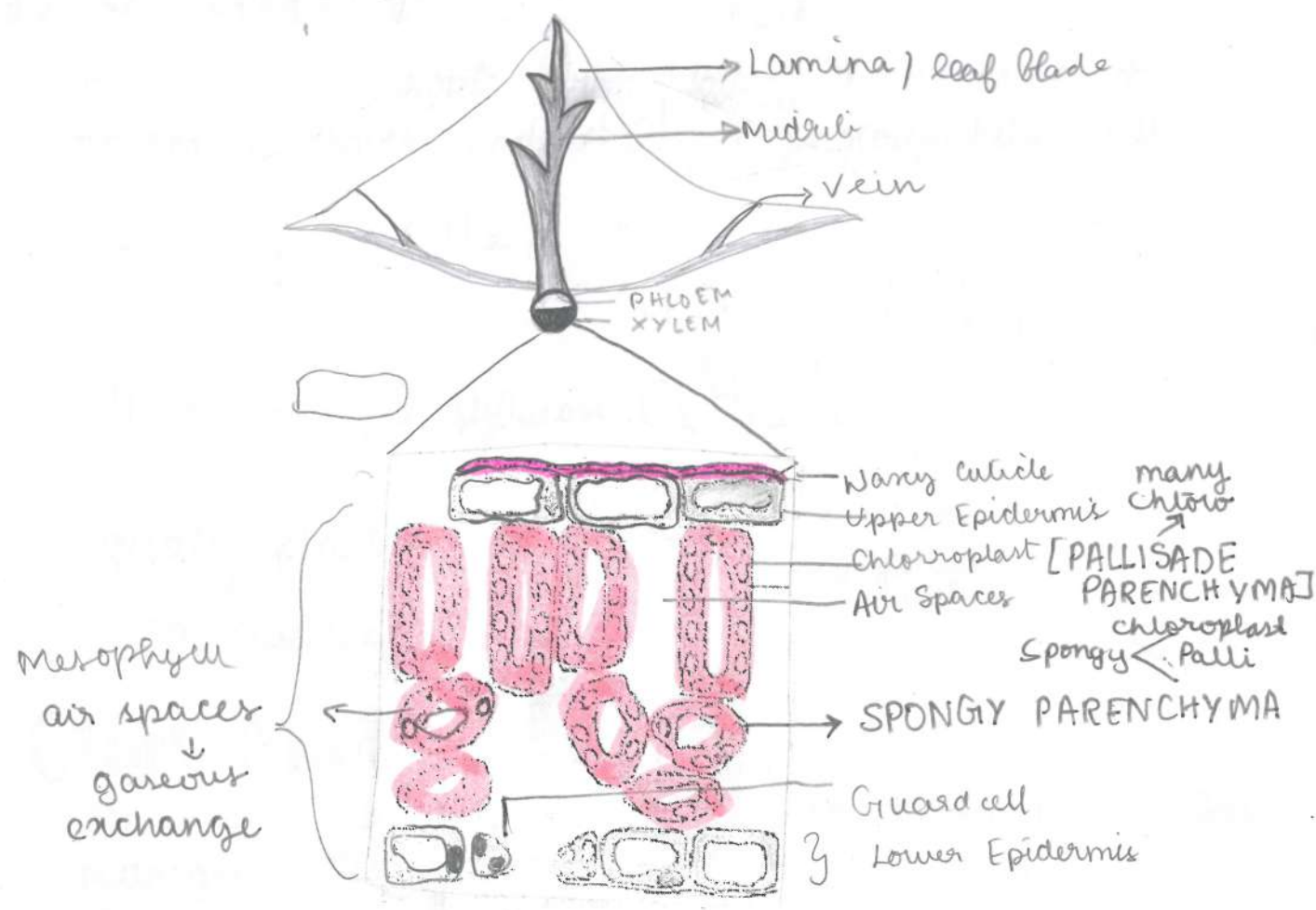
Plant Nutrition Photosynthesis

complex process - green plants synthesise organic food



SITE ↓

Chloroplast in guard + mesophyll cells
 organelles in cells of green plants containing
 Chlorophyll



RAW MATERIALS

* CO₂

when? → released in atmosphere - cellular respiration
- enters leaf through stomata - tiny pores

how? → Gaseous exchange in surface,

- * surface of stem
- * " " leaf
- * " " roots
- * stomata

www.wowmyspace.com

* H₂O - Water

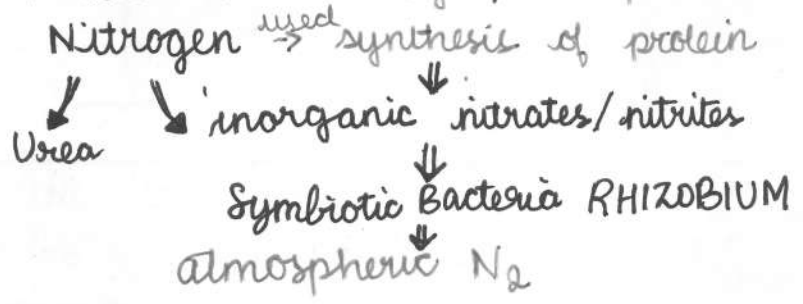
→ absorbed by roots from soil & transported ↑ XYLEM to leaves and then to photosynthetic cells.



→ Aquatic plants *Hydrallia, Vallisnaria*
↓
CO₂ dissolved in H₂O

* Other Materials MPIN

↑ Minerals - Nitrogen, Phosphorous, Fe, Magnesium : Soil



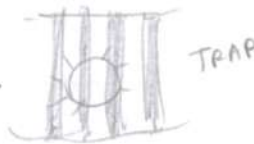
CONDITIONS

* **Sunlight** 

→ intensity
→ quality
→ duration } determine rate of photosynthesis

* **Chlorophyll**

→ trapping solar energy



EVENTS

www.wowmyspace.com

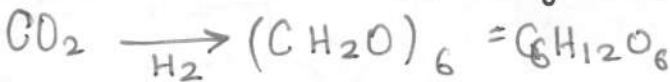
* **Absorption** of light energy by chlorophyll.

* **Conversion** of LIGHT energy → CHEMICAL energy

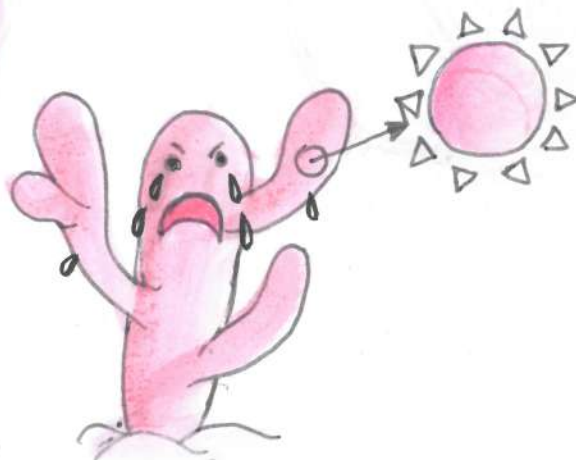
PHOTOLYSIS Splitting of water molecules into Oxygen & Hydrogen

* **Reduction** of Carbon dioxide to Carbohydrates

(sequence changes)
Desert Plants



NOTE



Take up CO₂
∴ ↓ H₂O loss
open stomata

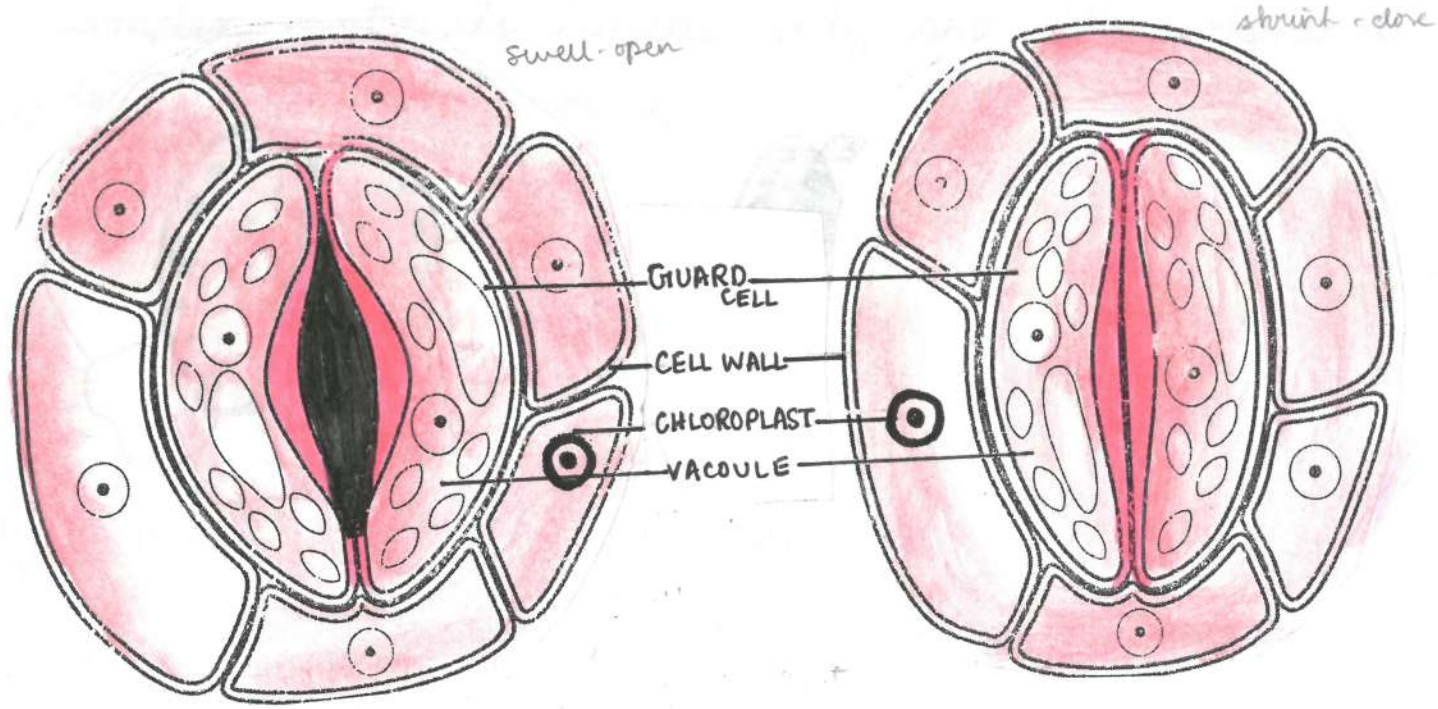
intermediate compound

Chlorophyll absorbed energy
acts upon

Stomata

- ▶ tiny pores - surface
- ▶ allow gasses to enter & exit leaf rapidly between plant and atmosphere.
- ▶ gaseous exchange $\xrightarrow{\text{regulate}} H_2O \downarrow$
- ▶ **Guard Cells** - bean shaped
 - control stomatal openings
 - contain - chloroplast
 - cell wall
- ▶ H_2O flows through G.C swells - opens

H_2O lost then G.C shrinks - closes



- ▶ Epidermal cells X CHLOROPLAST
- ▶ Stoma / Stomata ✓
- ▶ Palisade > Spongy Parenchyma
- ▶ Monocot $\xrightarrow{\text{Chloroplast}}$ Stomata only 1 side DOWN only!!
- ▶ Dicot \rightarrow PREVENT H_2O loss - lower E > upper E

www.wowmyspace.com

Heterotrophic

Holozoic inside body [MCH]

▷ complex food molecules are taken in and then broken down into simpler and soluble molecules.

▷ herbivores, omnivores & carnivores

Eg: Amoeba, Humans, cow, goat, cat, dog

Saprophytic outside body dead

▷ feed upon dead organic matter & breakdown complex materials outside body and then absorb it.

Eg: Bread mould, mushroom, yeast, bacteria

Parasitic HOST

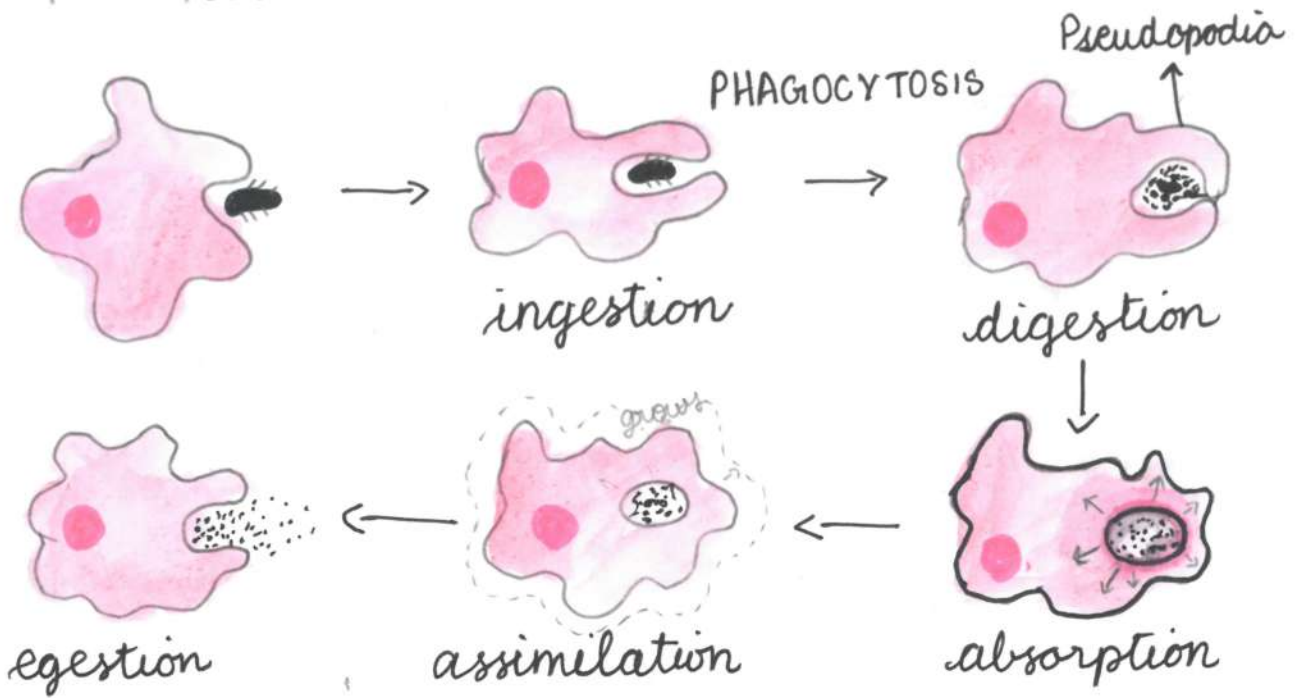
▷ live either on / in the body of HOST to obtain their nutrition without killing them.

Eg: Plasmodium, ticks, lice, leech, tapeworm, flatworm, Cuscuta.

unicellular

AMOEBA *holozoic* Phagocytosis

pseudopodia



PARAMOECECIUM *holozoic*

- > has definite shape
- > Cilia
- > engulf food through oral groove
- > food vacuole - created engulfing food
- > moves through cytoplasm
- > food digested in food vacuole absorbed by cytoplasm
- > undigested pore - given out
↓
anal pore

HUMANS

A = appearance

L = location

F = function

P = parts

- ▷ omnivorous = eat plant based + animal based
 - ▷ digestive system = alimentary canal + glands
 - ▷ 1. ingestion
 - 2. digestion
 - 3. absorption
 - 4. assimilation → whole body
 - 5. egestion
- } in alimentary canal
- } whole body

Alimentary Canal

A long tube varying diameter

A mouth → anus

www.wowmyspace.com

① Mouth

- first part - food enters

P. tongue

A) ↑ muscular sensory organ

L) floor of buccal cavity

F) function:

= bears several taste buds

= help mixing food = saliva

• teeth upper jaw } bones lower jaw }

A) hard structures

L) bones of upper & lower jaw

F) used for grinding, cutting & chewing

Mastication

F) Chewing ↑ surface area - digestion

Pharynx



- A small funnel shaped chamber
- L behind oral cavity
- F serves both digestive & respiratory functions

EPIGLOTTIS oesophagus & windpipe

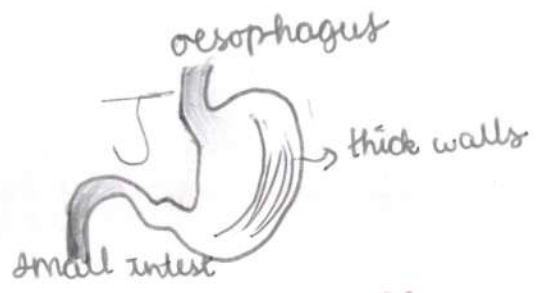
www.wowmyspace.com


Oesophagus



- A thin long muscular tube - valve - each end
 - F transport food & fluid - Peristaltic movement
- mouth → stomach

Stomach



- A J-shaped muscular organ
 - L left side of abdomen
 - F food - churned (foods breaks down → smaller pieces)
 - F store  of food - partial digestion
- secretion of Gastric glands
- Chyme
↓
semi solid paste
- F muscular walls help mixing food + digestive juices

↓ SPANTER

SMALL INTESTINE

- A longest in alimentary canal
 - F Villi = finger-like projections
 - F site for complete digestion = absorbs nutrients
 - F secretions of Liver + Pancreas = help digestion
- ↑ surface area of absorption (amino acids + sugar)
- duodenum
jejunum
ileum
- * fats absorbed by lymph vessels in villi of S.I

Note: carnivorous < herbivorous

longer small intestine

↳ cellulose digestion

↑ time & energy

Large Intestine F reabsorbs fluids & collects undigested food

A wider in diameter than small intestine

F Appendix ← COLON (reabsorbs fluids & processes waste)



Rectum

A last & broad chamber-shaped

F temporarily store FEACAL matter

www.wowmyspace.com

Anus ↓

A end point

F exit of waste - regulated - Anal Sphincter

Digestive Glands

Salivary (PTYALIN)

→ contain enzyme Salivary Amylase

→ mouth ^{large starch} waters → ^{Complex Sugar molecules} smaller molecules

→ lubricates + softens food

Gastric

wall of stomach

① HCl F - KILLS bacteria ingested with food
F - creates ACIDIC medium to activate pepsin

② Pepsin: F - digests PROTEINS

③ Mucus: protects lining of stomach from HCl.

Small Intestine

Liver

- * largest gland
 - * secretes **Bile Juice** - has/secreats **NO ENZYMES!!**
 - makes medium **ALKALINE** (basic) from STOMACH
 - **FAT** large globules $\xrightarrow{\text{emulsifier}}$ small globules $\circ\circ\circ$
 - \uparrow efficiency of enzymes
 - stored in **Gall Bladder** (extension of liver)
- \rightarrow UREA is formed

Pancreas

- * connected to small intestine by pancreatic duct
- * pancreatic juices \rightarrow

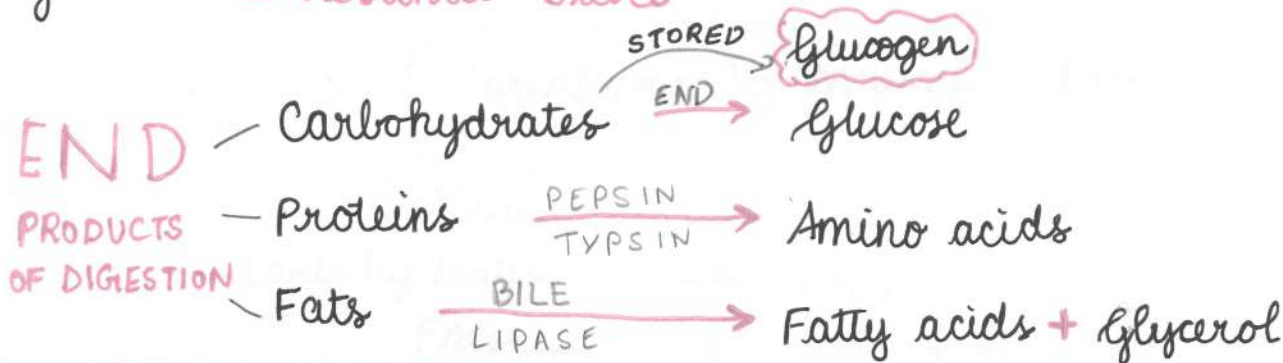
Lipase
fat digestion
hydrolyses fat & oils

Trypsin
protein digestion

www.wowmyspace.com

Intestine

- * walls of small intestine contain numerous glands **Intestinal Juice**



enzymes	\Rightarrow substrates
TRYPSIN	\rightarrow Protein
AMYLASE	\rightarrow Starch
PEPSIN	\rightarrow Protein
LIPASE	\rightarrow Fats

MECHANISM

Ingestion

www.wowmyspace.com

- * intake of food by mouth
- * food is moistened by SALIVA it masticated by teeth

Digestion



hydrolysis of complex polymers
↓
monomers

- * breaking down large organic molecules into smaller molecules with help of **ENZYMES** = bio-catalysts

Carbohydrates digestion initiates in mouth

Starch $\xrightarrow{\text{Salivary Amylase}}$ Simple sugars



Pepsin digest protein \rightarrow PEPTONES



has no ENZYME

Bile Juice emulsification of Fat



Lipase breakdown of emulsified Fat



Protein	\longrightarrow	Amino acids
Carbohydrates	\longrightarrow	Glucose
Fats	\longrightarrow	Glycerol + Fatty Acids

Absorption

- * food passes from alimentary canal into blood
digested food is taken up by Small Intestine's WALLS



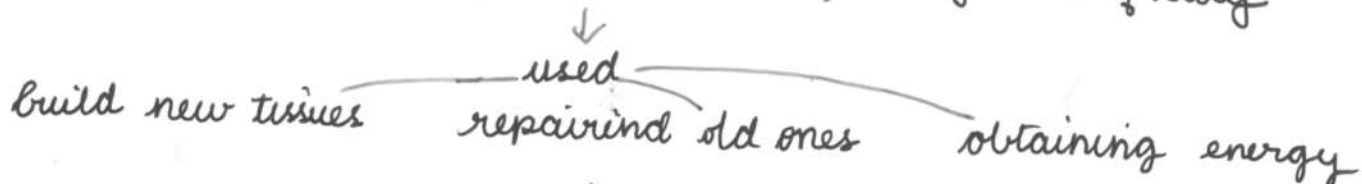
Villi + Lacteals
small lymph capillaries
found in Villi

Assimilation

★ distribution of digested food products to various cells of body

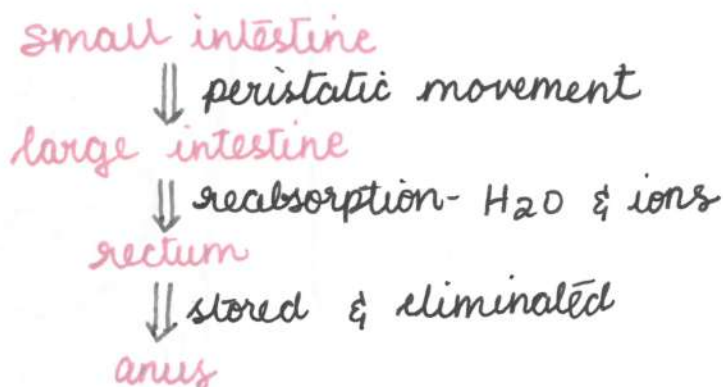
★ Villi-rich blood vessels - in Small Intestine

take up absorbed food \downarrow to each & every cell of body



Egestion

★ elimination of undigested food formed in colon of large intestine through anus.



Peristalsis

www.wowmyspace.com

- necessary action of digestive process
- regulated movement - along digestive tube
- lining of A.C has MUSCLES - contract rhythmically - push forward

Tooth Decay

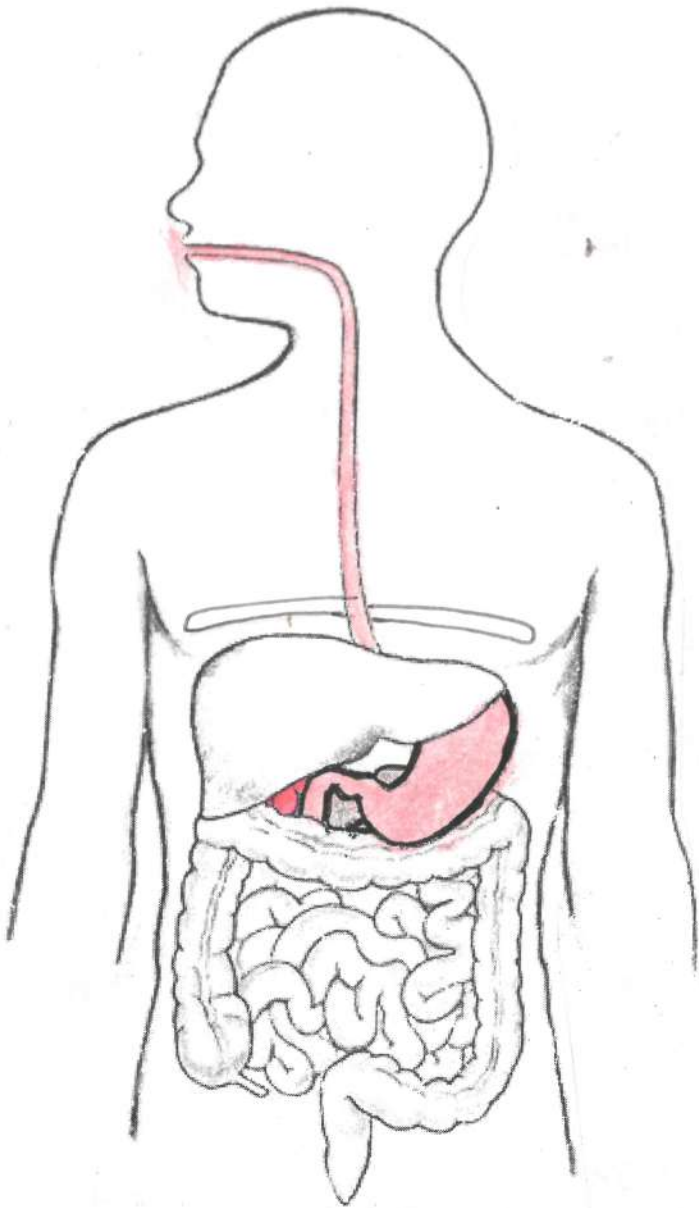
- gradual softening / demineralising of enamel & dentine

BACTERIA + FOOD $\xrightarrow[\text{on teeth}]{\text{stick}}$ PLAQUE
 \downarrow
 acts on sugar to produce acids

covers tooth surface
 Saliva X can't neutralise

\downarrow
 BRUSH - removes plaque before
 in form ACIDS

- If UNTREATED - microorganisms - invade pulp
 \downarrow inflammation \downarrow infection



www.wowmyspace.com